



AVR-320 AV-Receiver

# CONTENTS

IMPORTANT SAFETY INSTRUCTIONS .....	3
BEFORE USE .....	5
CONNECTION .....	6
FRONT PANEL INFORMATION .....	11
REAR PANEL INFORMATION .....	12
REMOTE CONTROL UNIT .....	13
REMOTE CONTROL INFORMATION .....	14
BASIC OPERATION .....	16
SPEAKER CONFIGURATION, DELAY TIME & DYNAMIC RANGE CONTROL .....	19
TEST TONE, LFE TRIMMER & CHANNEL SELECT .....	20
AVAILABLE SURROUND MODE .....	21
TROUBLESHOOTING .....	22
SPECIFICATIONS .....	23

Thank you for purchasing our AV Receiver. This unit is precision engineered to provide you with years of trouble free service. Please read the following pages of the User's Manual to ensure correct operation of the unit.

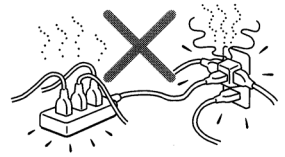
Prepare to enjoy surround sound the way it should be!

## IMPORTANT SAFETY INSTRUCTIONS

### CAUTION: READ THIS BEFORE OPERATING YOUR UNIT.

1. **READ AND FOLLOW INSTRUCTIONS:** All the safety and operation instructions should be read before the product is operated. Follow all operation instructions within this manual.
2. **RETAIN THESE INSTRUCTIONS:** The safety and operation instructions should be retained for future reference.
3. **HEED WARNINGS:** Comply with all warnings on the product and in the operation instructions.
4. **CLEANING:** Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
5. **GROUNDING OR POLARIZATION:** This product may be equipped with a polarized alternating current line plug (a plug having one pin wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician since it is likely you have an out of sate wall socket. Never force the plug into the socket.

6. **OVERLOADING:** Do not overload wall outlets or extension cords as this can result in the risk of fire or electric shock. Overloaded AC outlets, extension cords, frayed power cables, damaged or cracked wire insulation, and broken plugs are dangerous. They may result in electric shock or fire hazard. Periodically examine the power cable - if its appearance indicates damage or deteriorated receptacles have it replaced by your service technician.

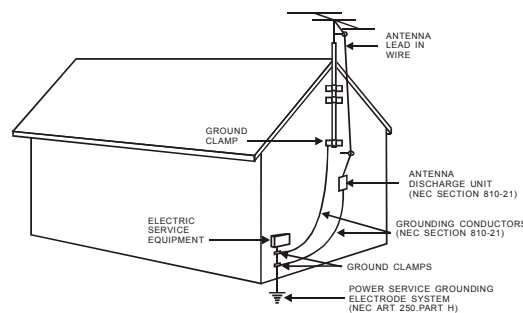


7. **POWER SOURCES:** This product should be operated only from the type of power source indicated on the rear panel label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. For products intend to be operated from battery power, or other sources, refer to the operation instructions.

8. **ACCESSORIES:** Do not place this product on an unstable surface or support. The product may fall, causing serious injury to a child or adult as well as serious damage to the product. Any mounting of the product should follow the manufacture's instructions and use a mounting accessory recommended by the manufacturer. A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.



9. **OUTDOOR ANTENNA GROUNDING:** If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. The example below is for reference only. Correct grounding should always be installed by an electrician.

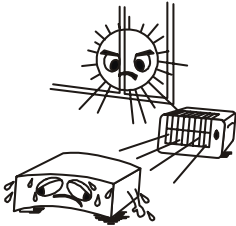

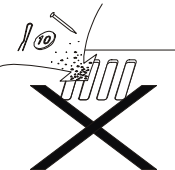
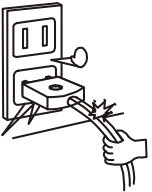
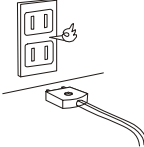
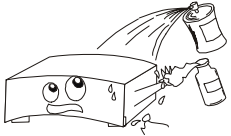
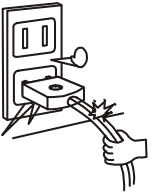

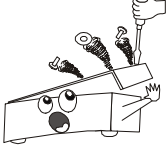


10. **POWER CABLE PROTECTION:** The power supply cables should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cables at plugs and the point where they exit from the product.

11. **ATTACHMENTS:** Do not use unauthorized attachments as they may cause faults with the unit.

## IMPORTANT SAFETY INSTRUCTIONS

12. **CONDITIONS REQUIREING SERVICE:** Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
- If the unit exhibits sudden unusual operation or unusual display characteristics.
  - If liquid has been spilled, or objects have fallen into the product.
  - If the product has been exposed to rain or water.
  - If the product does not operate normally by following the operation instructions, adjusting only those controls that are covered by the operation instructions. (**NOTE:** improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation).
  - If the product has been dropped or damaged in any way.
  - If the product exhibits a distinct change in performance.
13. **SERVICING:** Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage and may damage precision components. Refer all servicing to qualified service personnel.
14. **LIGHTNING:** For added protection during a lightning storm, or when the unit is left unattended and unused for long period of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power line surges.
15. **REPLACEMENT PARTS:** Should replacement parts be required, have the service technician verify that the replacement parts he uses have the same safety characteristics as the original parts. Use of unauthorized replacements parts can cause fire or electric shock.
16. **SAFETY CHECK:** Upon completion of any service or repairs to this product, ask the service technician to perform safety checks recommended by the manufacturer to determine that the product is in a safe operating condition.
17. **HEAT DISPERSAL:** Leave at least 10 cm of space between the top, back and sides of the unit and the wall or other electrical components.
18. **NOTES ON USE**

 <ul style="list-style-type: none"> <li>● Avoid high temperatures Allow for sufficient heat dispersion when installed on a rack.</li> </ul>	 <ul style="list-style-type: none"> <li>● Keep the set free from moisture, water, and dust.</li> </ul>	 <ul style="list-style-type: none"> <li>● Do not let foreign objects in the set.</li> </ul>
 <ul style="list-style-type: none"> <li>● Handle the power cord carefully. Hold the plug when unplugging the cord.</li> </ul>	 <ul style="list-style-type: none"> <li>● Unplug the power cord when not using the set for long periods of time</li> </ul>	 <ul style="list-style-type: none"> <li>● Do not let insecticides, benzene, and thinner come in contact with the set.</li> </ul>
 <ul style="list-style-type: none"> <li>● Handle the power cord carefully. Hold the plug when unplugging the cord.</li> </ul>	 <p>*(For sets with ventilation holes)</p> <ul style="list-style-type: none"> <li>● Do not obstruct the ventilation holes</li> </ul>	 <ul style="list-style-type: none"> <li>● Never disassemble or modify the set in any way.</li> </ul>

## BEFORE USE

### Read this before operation

1. Choose the installation location of your unit carefully. Avoid placing it in direct sunlight or close to a source of heat. Also avoid locations subject to vibrations and excessive dust, cold or moisture.
2. Do not cover the ventilation holes. Make sure there is enough space above and beside this unit (about 4 inches). Do not place a CD player or other equipment on top of this unit.
3. Do not open the cabinet as this might result in damage to the circuitry or electrical shock. If a foreign object falls into the unit, contact your dealer.
4. When removing the power plug from the wall outlet, always pull directly on the plug, never on the cord.
5. Do not attempt to clean the unit with chemical solvents as this might damage the finish. Use a clean, damp cloth only.
6. Keep this manual in a safe place for future reference.

### Back-up Memory Function

This is the function that preserves the preset memory and most-recent memory function. In the event of a power failure, or if the power cord of this unit is disconnected from the electric outlet, the back-up memory will preserve the preset memory and most-recent memory functions for approximately 1 week. If the power supply is interrupted for 7 days or longer, the memory settings will be erased.

#### When to use RESET switch

1. When this system is subjected to an electric shock.
2. When the power is irregular.

In this case, try the following:

Switch the **POWER** on, press the RESET button on the front panel for more than 3 seconds.

**Note:** If the **RESET** button is pressed for more than 3 seconds, all the memory will be erased.

### Before Connection

#### Caution

- Disconnect all equipment from the power source before making any connections.
- Read instructions of each component you intend to use with this unit.
- Be sure to insert each plug securely. To prevent hum and noise, do not bundle the connection cords with power cord or speaker cord.

### Speaker Connections

#### Caution:

- To avoid damaging the speakers with a sudden high-level signal, be sure to switch the power off before connecting the speakers.
- Check the impedance of your speakers. Connect speaker with an impedance of 6 ohms or more.
- The amplifier's colored speaker terminals are the + (positive) terminals and the black terminals are the - (negative) terminals.
- The + side of the speaker cable is marked to make it distinguishable from the - side of the cable. Connect this marked side to the colored + terminals and the unmarked side is the black terminal.
- Prepare the speaker cords for connection by stripping off approximately 10 mm or less (no more as this could cause a short-circuit) of the outer insulation.
- Twist the wires tightly together so that they are not straggly.

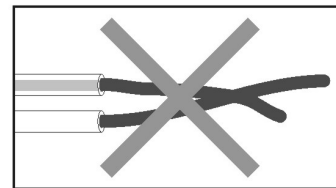
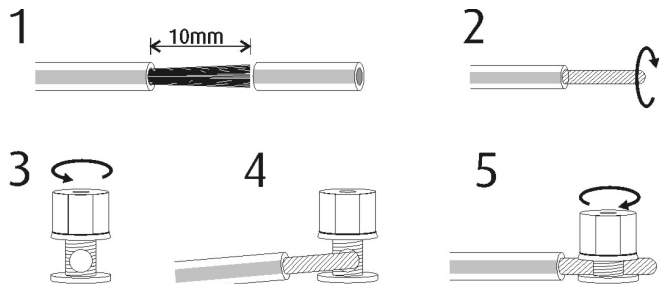
#### How to connect

Loosen the speaker terminals on the rear panel by twisting them against the clock.

Put the stripped cable into the hole in the terminal, and tighten the terminal on to the cable, by twisting the terminal with the clock.

Colored: positive (+)

Black: negative (-)



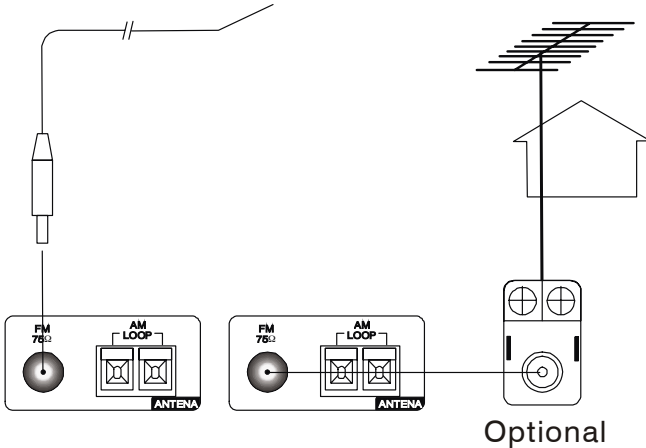
## CONNECTION

### FM INDOOR ANTENNA

If you live reasonably close to a transmitter and want to use the provided lead-type FM antenna, you will have to connect it direct to the "FM 75" socket.

Fit the metal sleeve of the lead-type antenna over the core (center) conductor of the (FM 75) socket, extend the lead and fix it to a window frame or wall with thumbtacks, or the like, where reception is best.

Lead-type FM 75 Antenna provided.



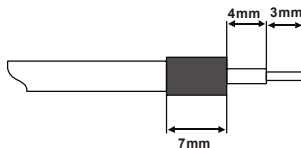
### OUTDOOR FM ANTENNA (75)

#### FM OUTDOOR ANTENNA

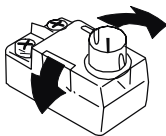
In an area where FM signals are weak, it will be necessary to use a 75 unbalanced-type outdoor FM antenna using the optional matching transformer, as shown. Generally, a 3-element antenna will be sufficient: if you live in an area where the FM signals are particularly weak, it may be necessary to use one with 5 or more elements. Connect the coaxial cable of the antenna to the matching transformer as shown. After completing connection, plug the transformer into the "FM 75" socket.

#### How to connect a coaxial cable to the matching transformer

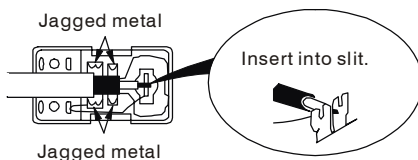
- Strip the cable and dress it as shown.



- Press both side tabs outward to remove the cover.

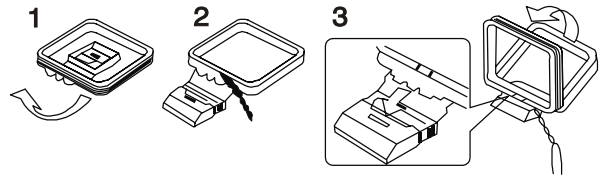


- Wrap the core conductor around the central metal fixture as shown.
- Crimp the jagged metal fixtures so they hold the braided portion using pliers, etc.
- Put the cover back in place.



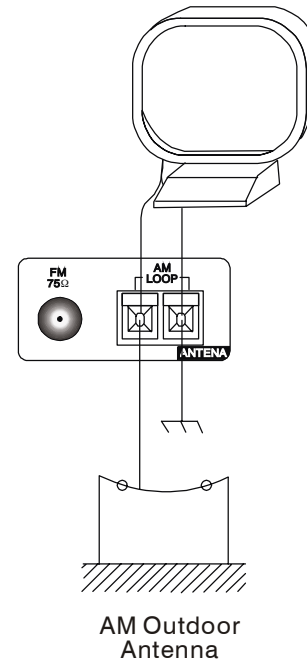
### AM INDOOR LOOP ANTENNA

- To stand the antenna on a flat surface, fix the claw to the slot.



- The high performance AM loop antenna provided with this unit is sufficient for good reception in most areas.
- Connect the loop antenna's wires to the AM antenna terminals as shown.
- Place the antenna on a shelf or hang it on a window frame, etc, in the direction which gives the best reception and as far away as possible from the entire system, speaker cords and the power cords, to prevent unwanted noise.

### AM Loop Antenna (provided)



### AM Outdoor Antenna

If the AM loop antenna provided does not deliver sufficient reception (because you are too far from the transmitter or in a concrete building, etc.), it may be necessary to use an outdoor AM antenna.

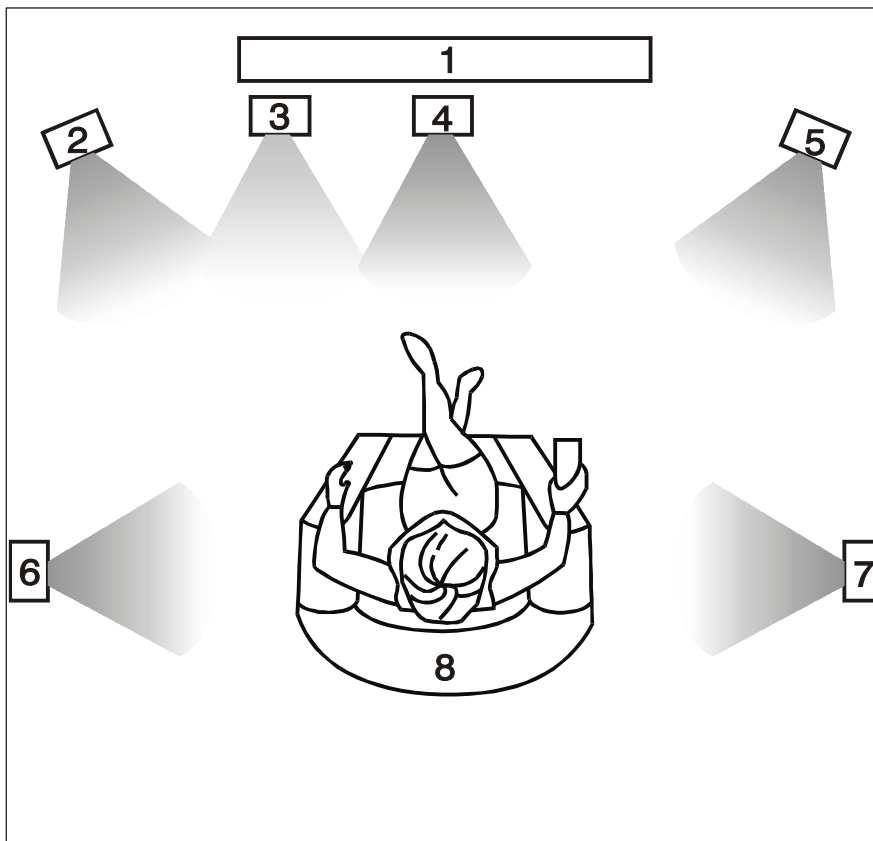
Use an insulated wire more than 15 ft (5m) long, strip one end, and connect this to the terminal as shown.

The antenna wire should be strung outdoors or indoors near a window. For better reception, connect the GND terminal to a reliable ground.

**Note:** When connecting an outdoor AM antenna, do not disconnect the AM loop antenna.

## CONNECTION

### Speaker layout example when using surround mode



- |                           |                        |                          |
|---------------------------|------------------------|--------------------------|
| 1. TV or Screen           | 2. Front Left Speaker  | 3. Subwoofer             |
| 4. Center Speaker         | 5. Front Right Speaker | 6. Surround Left Speaker |
| 7. Surround Right Speaker | 4. Listening Position  |                          |

#### Standard speaker setup for surround sound

- **Front Right and Left speakers**  
These are the main speakers providing the front stereo effect of the sound image.
- **Centre speaker**  
This produces a rich sound image by serving as a centre sound source for the front right and left speakers thus enhancing the sonic movement.
- **Surround Right and Left speakers**  
These add three-dimensional sonic movement and produce environmental sound associated with the background and effect sounds for each scene.
- **Subwoofer**  
Required to add powerful and heavy bass.

#### Speaker placement

Ideal speaker placement varies depending on the size, shape of your room and the wall coverings. Here is a typical example of speaker placement and recommendations as shown.

##### Important points regarding speaker placement

##### **Front Right and Left speakers and Centre speaker**

- Place these three speakers all at the same height.
- Place each speaker so that it is aimed at the location of the listener's ears when at the listening position.
- Try to place all the front speakers at the same distance from the listening position.

##### **Surround Left and Right speakers**

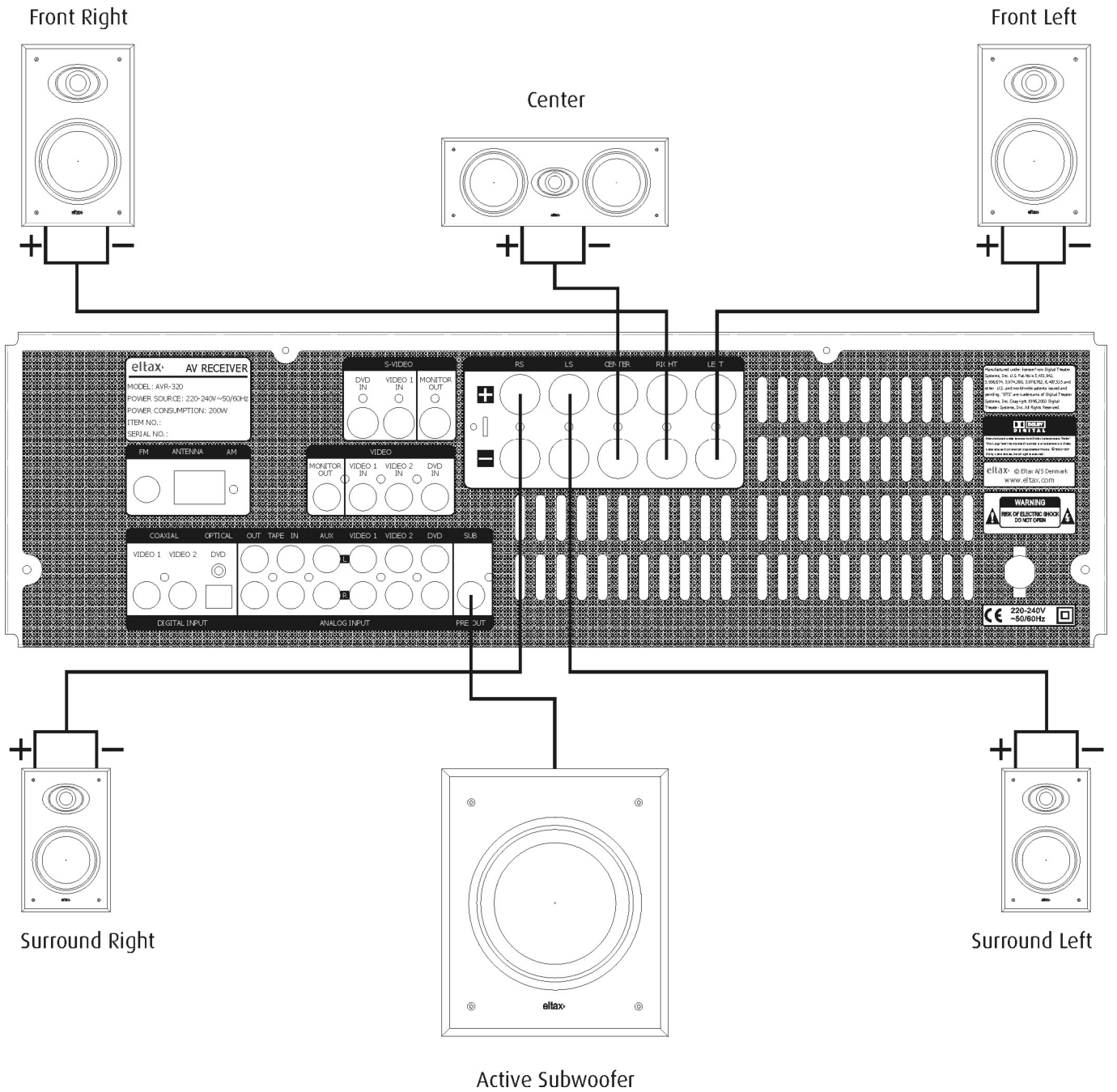
- Place these speakers so that their height is 3 feet (1 meter) higher than that of the listener's ears.

##### **Subwoofer**

Ideally a subwoofer should always be located in front of the listening position between the Front Left and Right speakers. Since all rooms vary, experiment with the placement of your subwoofer for the best overall sound image (placing a subwoofer in the corner of a room often helps to disperse the sound).

# CONNECTION

## SPEAKER CONNECTION



### Power cord (AC)

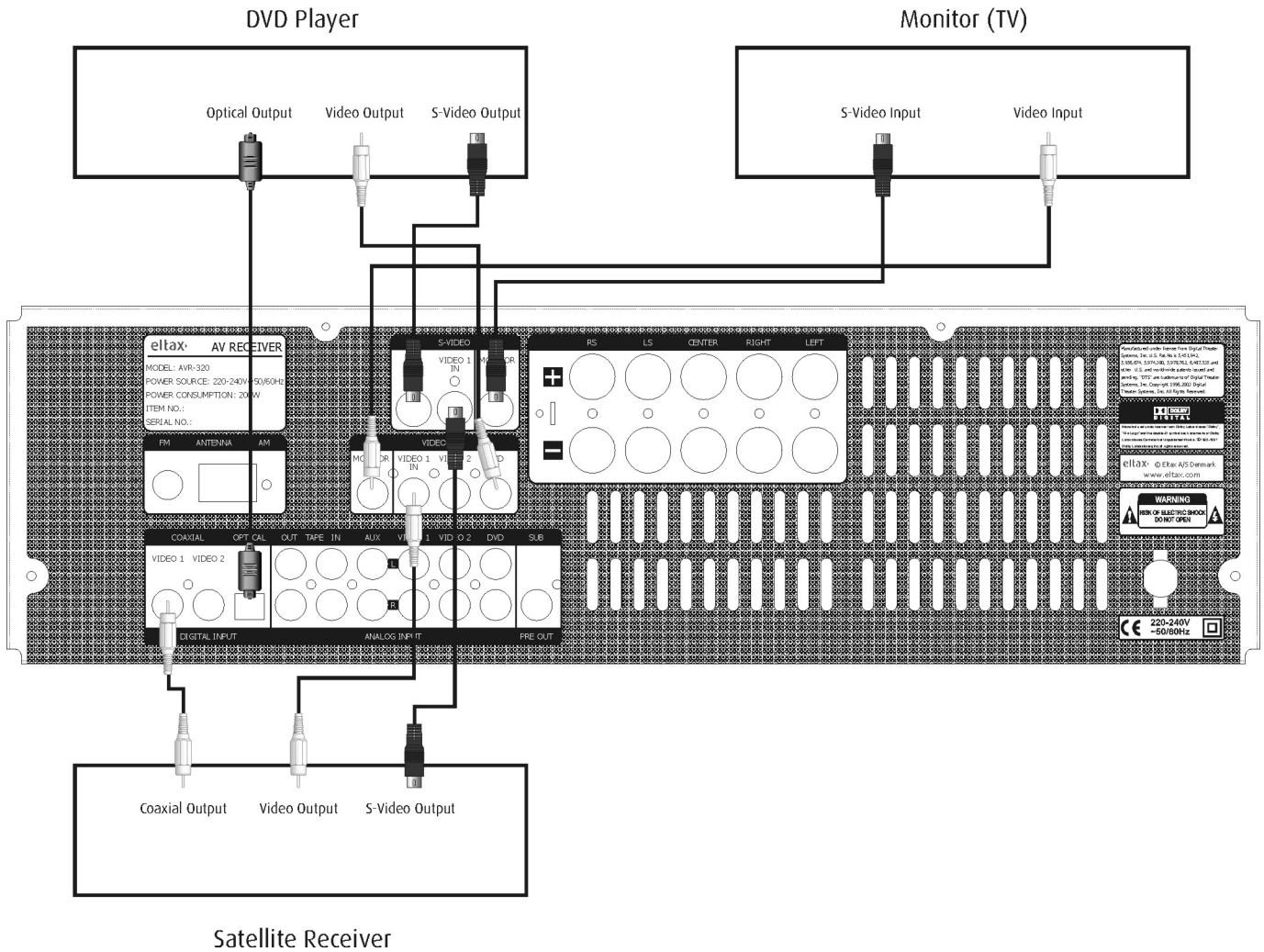
- Be sure to connect the power cord to an AC outlet, which supplies the correct voltage.
- Hold the power plug when plugging or unplugging the power cord.

### Subwoofer Out

Use this jack to connect an active subwoofer.



## CONNECTION



When connecting video components such as DVD players, cable boxes, satellite receivers and television/plasmas, you can use different types of cables depending on how the video component is equipped.

### Video connections:

If the video component is equipped with S-VIDEO jacks, it is recommended to connect to your unit or directly to the television monitor using an S-VIDEO cable. S-VIDEO cables provide better picture clarity and resolution. If the video component is not equipped with an S-VIDEO jack, use a conventional RCA or RCA composite cable to connect to your unit or connect it directly to the television. The illustration here shows how to connect video components to your unit.

### Note:

When connecting more than one video component to your unit (i.e. VCR and DVD player) it is easier to use either all S-VIDEO cables or all RCA to RCA composite cables. This allows both video signals (DVD and VCR) to be sent through your unit to the TV monitor

using just one video input on the TV (S-Video or RCA). Regardless of the video component being played DVD or VCR, the picture will always appear on the same video input of the monitor.

If you use both S-Video and RCA composite cables to connect different video components to your unit, you must also use both S-Video and RCA composite cables to connect the TV monitor to your unit. For example, if you connect a DVD player to your unit using S-Video cable and a VCR using an RCA to RCA composite cable, you must also connect the TV to your unit using both types of cables. This requires an S-Video cable from the S-Video monitor out jack on your unit to an S-Video input on the TV (i.e. Video 1). In addition, you must use an RCA composite cable from the composite video monitor out jack on your unit to an RCA composite video input on the TV but not the same input used for the S-Video cable (i.e. Video 2). Using this type of dual cable video connection, you will need to switch the TV video input source from TV to Video 1 to Video 2 depending on the video source being played-TV, DVD or VCR.

## CONNECTION

### Audio connections:

Some video components are equipped with special digital audio outputs (e.g. DVD players). If your video component is equipped with a digital audio output, it is recommended that you connect to your unit using a digital cable. Digital audio cables are required to use the DTS and Dolby Digital surround sound modes. If you do not use digital connections, your unit will only operate in Dolby PRO LOGICII, MUSIC, THEATER, HALL and 5 Stereo surround modes. There are two types of digital cables-coaxial (75 ohm) and optical. Your unit is equipped with both types of digital inputs. These inputs are labelled COAXIAL IN and OPTICAL IN on the rear of the unit. Connect the video component outputs to any one of the two digital inputs on your unit. If the video component is not equipped with a digital output, use a dual RCA to RCA composite audio cable to connect to your unit. Make sure to connect:

**White plug to white jack (L: left)**

**Red plug to red jack (R: right)**

### Note:

When an optical cable is used, remove the protection caps from the component and your unit before attempting to insert the optical cable. If not using an optical cable or if the cable is removed, always re-install the protection caps to prevent dirt and dust from entering the inputs. If using a coaxial digital cable, leave the protection caps in both the video component and your unit.

### CD, TAPE jacks

Connect the component with RCA to RCA cords. Make sure to connect:

**White plug to white jack (L: left)**

**Red plug to red jack (R: right)**

### DIGITAL IN/OUT terminals

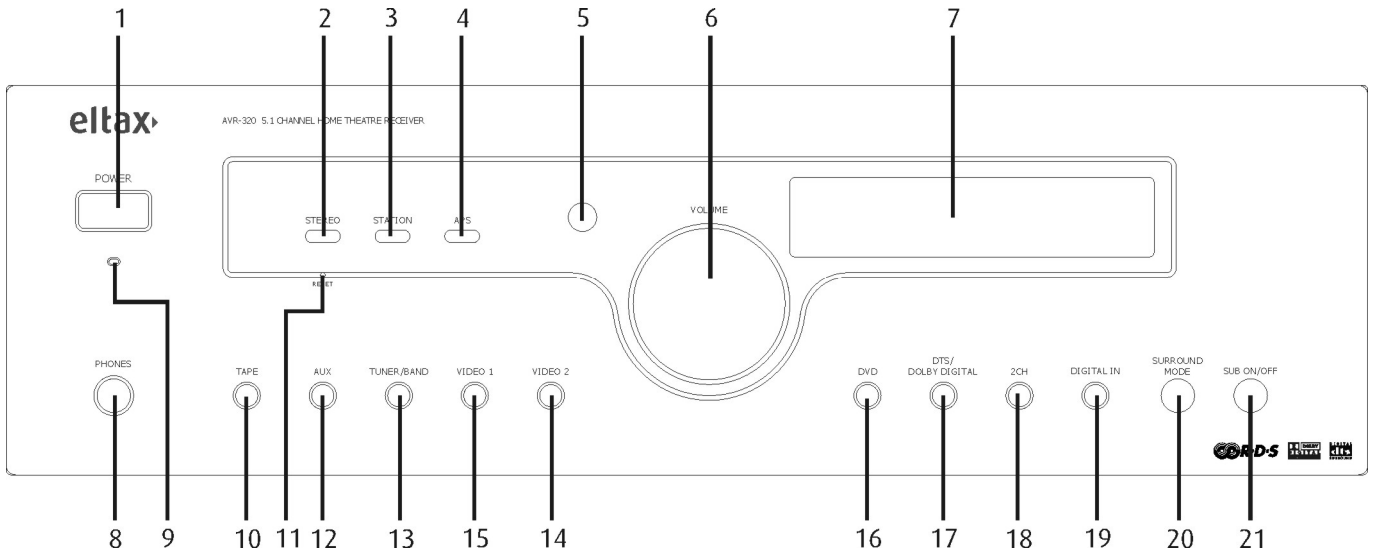
If the CD player or MD player has digital outputs, connect the component with coaxial cables or optical cables.

**DIGITAL IN to DIGITAL OUT (CD, etc.)**

**DIGITAL OUT to DIGITAL IN (MD, etc.)**

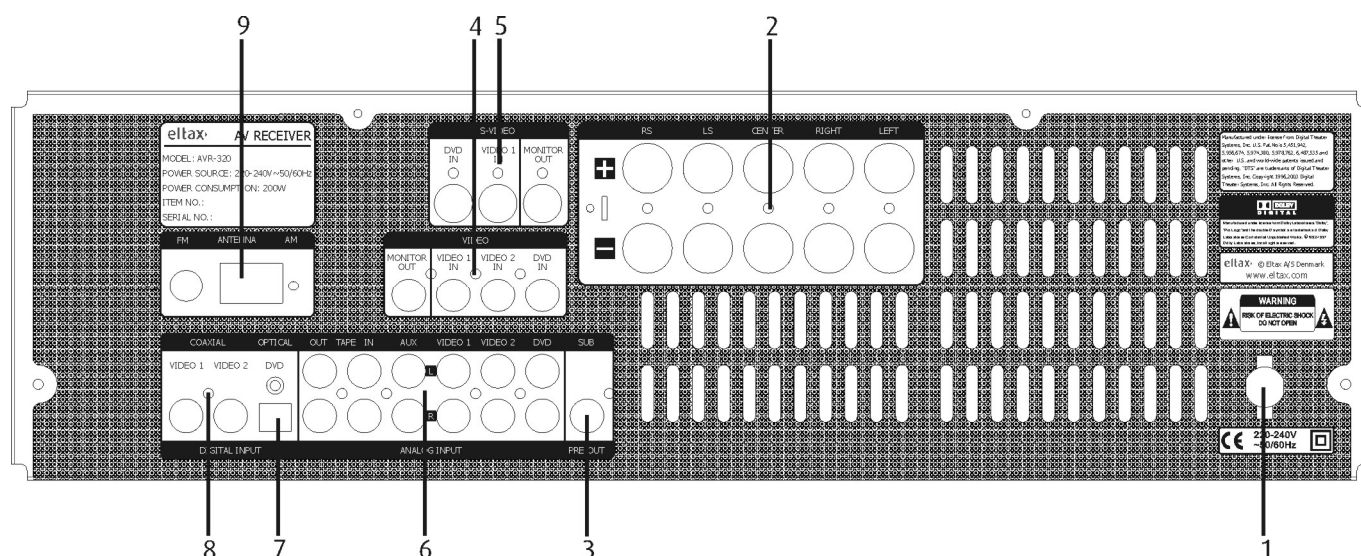
Connect to any one of the DIGITAL IN terminals. When using DIGITAL OPTICAL IN terminals, remove the caps from the terminals. When you do not use them, leave the caps in place. To record digitally, connect the source (CD player, etc.) to DIGITAL IN and the recorder (MD, etc.) to DIGITAL OUT.

## FRONT PANEL INFORMATION



<b>1. POWER</b>	Turns the unit on/off.	<b>12. AUX</b>	Press this button to select AUX.
<b>2. STEREO</b>	Press this button to alternate between Stereo and Mono mode when listen to FM broadcast.	<b>13. TUNER/BAND</b>	Press this button to select the TUNER. Press again to select FM and AM.
<b>3. STATION</b>	When using the Tuner press this button to select a preset channel.	<b>14. VIDEO 2</b>	Press this button to select VIDEO 2.
<b>4. APS</b>	Allocates and memorizes radio stations automatically. ( <b>Note:</b> Hold this button down for more than 3 seconds to activate)	<b>15. VIDEO 1</b>	Press this button to select VIDEO 1.
<b>5. REMOTE SENSOR</b>		<b>16. DVD</b>	Press this button to select DVD.
<b>6. VOLUME</b>	To decrease or increase the Master Volume.	<b>17. DTS/DOLBY DIGITAL</b>	When playing 5.1CH source, and while you are enjoying Stereo, press this button to playback source in DTS/DOLBY DIGITAL.
<b>7. VFD DISPLAY UNIT</b>	Informs you of selected inputs and system state.	<b>18. 2CH</b>	Select STEREO mode ( <b>Note:</b> only Front Left & Front Right and Woofer speakers are activated).
<b>8. PHONES</b>	Jack for stereo headphones.	<b>19. DIGITAL IN</b>	Press this button when using a source connected by a DIGITAL IN. Press it to select : DVD COA. DVD OPT, VIDEO 1 OPT and VIDEO 2 OPT, or when using an analog source.
<b>9. STANDBY INDICATOR</b>		<b>20. SURROUND MODE</b>	Select surround modes: MOVIE and MUSIC.
<b>10. TAPE</b>	Press this button to select TAPE.	<b>21. SUB ON/OFF</b>	Press this button to turn on/off the subwoofer.
<b>11. RESET</b>	To reset the whole system to factory defaults.		

## REAR PANEL INFORMATION



1. **AC CORD:** Connect to the AC mains socket.
2. **SPEAKERS:** External speakers power output. (Refer to Speaker Connection section)
3. **SUB LINE OUT:** Pre-out for an active subwoofer.
4. **S-VIDEO IN/OUT** terminals:
  - **DVD S-VIDEO IN:** Connect an S-VIDEO cable to the S-VIDEO output terminal of a DVD player.
  - **VIDEO-S IN:** For connection of S-VIDEO cable to the output terminal of an external player.
  - **VIDEO-S OUT:** For connection of S-VIDEO cable to the input terminal of an external player.
5. **VIDEO IN/OUT** terminals:
  - **VIDEO OUT:** Use an RCA composite cable to connect to the TV set.
  - **V1/V2 IN:** Connect RCA composite cables to the line outputs of external players.
  - **DVD IN:** Using an RCA composite cable to the line output of a DVD.
6. **ANALOGUE AUDIO IN/OUT** terminals
7. **DIGITAL INPUT:** Optical audio input for connection to the optical output of another DVD/Decoder/Games Console.
8. **COAX. IN:** Digital audio input for connection to the digital output of another DVD/Decoder/Games Console.
9. **ANTENNA terminal:** Connect to the AM indoor loop antenna/Lead-type FM antenna.

## REMOTE CONTROL UNIT

### REMOTE CONTROL

By using the provided remote control unit, this unit can be controlled from your listening position. To use the remote control unit, point it at the REMOTE SENSOR window of this unit.

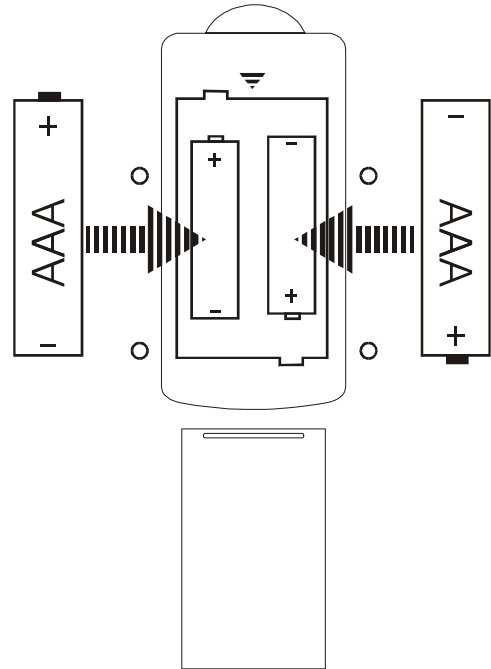
#### Notes:

- Even if the remote control unit is operated within the effective range, remote control operation may be impossible if there are any obstacles between the unit and the remote control.
- If the remote control unit is operated near other appliance which generate infrared rays, or if other remote control devices using infrared rays are used near the unit, it may operate incorrectly.
- The power is turned on/off (standby) by pressing the POWER button on the remote control unit in standby mode.

#### Precautions concerning batteries

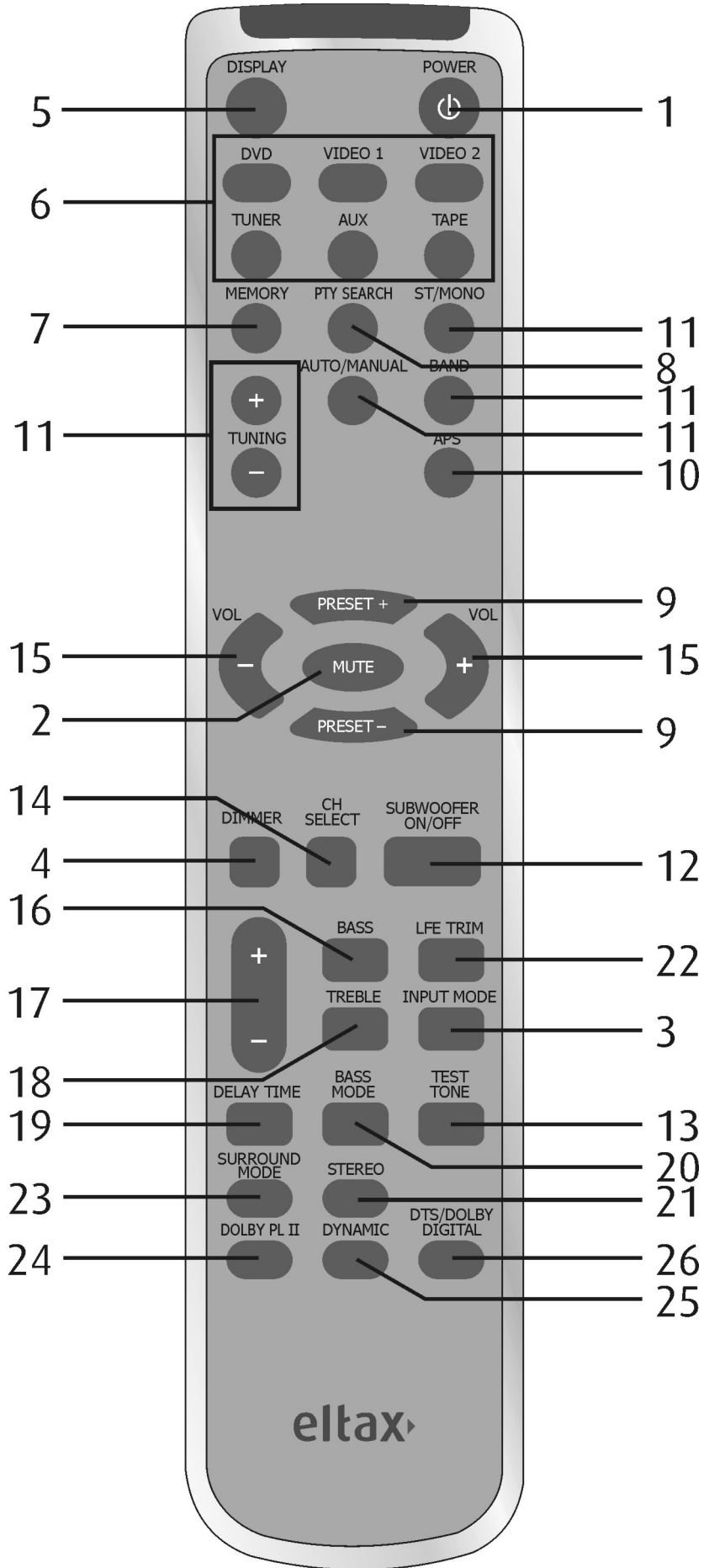
- Be sure to insert the batteries with correct positive+ and negative – polarities.
- Use batteries of the same type. Never use different types of batteries together.
- Rechargeable and non-rechargeable batteries can be used. Refer to the precautions on their labels.
- When the remote control unit is not to be used for a long time (more than a month), remove the batteries from the remote control unit to prevent them from leaking. If they leak, wipe away the liquid inside the battery compartment and replace the batteries with new ones.
- Do not heat or disassemble batteries and never dispose of old batteries by throwing them in a fire.

### BATTERY INSTALLATION



1. Remove the battery compartment cover.
2. Insert two “AAA” dry batteries. Make sure that the batteries are inserted with their positive “+” and negative “-” poles positioned correctly.
3. Close the cover until it clicks.  
If the distance required between the remote control unit and main unit decreases, the batteries are exhausted. In this case, replace the batteries with new ones.

# REMOTE CONTROL INFORMATION



## REMOTE CONTROL INFORMATION

1. **Power**  
Push this button to turn the unit into standby mode, push it again to turn off the unit.
2. **Mute**  
Press this button to mute the sound, push again to cancel the mute function.
3. **Input Mode**  
Select Coaxial, Optical or Analog Input mode in DVD, AV1 and AV2.
4. **Dimmer**  
Press this button to set the brightness of the front panel display.
5. **Display**  
Press this button to display the state of input source. And when listening to the FM broadcasting with RDS, press this button to show PS, PTY, RT and RT.
6. **Input Selector buttons**
7. **Memory**  
Press it to store the broadcast station as a preset.
8. **PTY Search**  
In FM state, press this button, the current program type appears on the display, using TUNING +/- to select the program type you desire.
9. **Station +/-**  
Press these buttons to select a preset channel during the tuner mode.
10. **APS**  
Allocates and memorizes radio stations automatically. (**Note:** Hold this button down for more than 3 seconds to activate)
11. **Tuning buttons**
  - Tuning +/-: Tuner frequency up and down.
  - Band: Press this button to alternate between FM and AM.
  - Auto/Manual: This button is used to select AUTO or MANUAL tuning for AM and FM stations. Press once to set to AUTO again for MANUAL.
  - ST/Mono: Press this button to alternate between Stereo and Mono mode when listen to FM broadcast.
12. **SUB On/Off**  
Push this button to turn on or off the subwoofer output.
13. **Test Tone**  
To balance speakers in Dolby Digital or Dolby Pro Logic mode.
14. **CH Select**  
Select channels by pushing this button, then use volume key to balance speakers.
15. **Volume +/-**  
Press these buttons to decrease or increase the volume.
16. **Bass**  
Press this button for **Bass** adjustment, then press +/- key to adjust the level.
17. **+/-**  
These keys are used for SPK SETUP and DELAY TIME, Treble and Bass adjustment.
18. **Treble**  
Press this button for **Treble** adjustment, then press +/- key to adjust the level.
19. **Delay Time**  
Press this button to set the delay time for the Dolby digital/Dolby Pro Logic modes.
20. **Bass Mode**  
Press this button to set the delay time for the Dolby digital/Dolby Pro Logic modes.  
Select one of the two preset speaker configuration according to your speakers. (refer to page 17)
21. **Stereo**  
With the unit in the STEREO mode, only front left and front right speakers and Woofer are working.
22. **LFE Trim**  
Under the Pro Logic 5.1CH or DTS 5.1CH mode, press this button and adjust the volume to set the Low Frequency output level
23. **Surround Mode**  
Select surround modes: MOVIE and MUSIC.
24. **Dolby Pro Logic II**  
When receiving Analog/digital PCM signal or 2CH Pro Logic, turn on this button then the playing is under analog 5.1CH state.
25. **Dynamic**  
Press this button repeatedly to reach your desired compression dynamic range.
26. **DTS/Dolby Digital**  
When playing 5.1CH source, and while you are enjoying Stereo, push this button to playback source in DTS/DOLBY DIGITAL.

## BASIC OPERATION

### BASIC OPERATION 1

1. Press the **POWER** button to put this unit into Standby Mode.
2. Press one of the source buttons to activate the unit.
3. Select the desired source by pressing **DVD, VIDEO 1, VIDEO 2, TUNER, AUX or TAPE**.  
If you have selected DVD, VIDEO 1, VIDEO 2 (not TUNER, AUX or TAPE), press **INPUT MODE, SURROUND MODE, DTS/DOLBY DIGITAL, STEREO, DOLBY PROLOGIC II** or **DIGITAL IN** in accordance with the type of signal you are receiving and the sound output you require (for example, Dolby Pro Logic II if the DVD movie is an older "classic" and only recorded in stereo).
4. Play the source, and gradually turn up the volume to the required level with the **VOLUME** control.

### BASIC OPERATION 2

#### A. **POWER** button

Press this button to turn this unit into standby mode, then the STANDBY indicator lights up, press one of the source buttons to activate this unit, the standby indicator goes out when this unit is turned on.

#### B. **SURROUND MODE**

This mode is used to achieve a realistic sound field with a "three-dimension", giving the sense of distance, movement and relative position, creating a real and powerful sense of presence.

#### C. **STEREO**

In the STEREO mode, only the Front Left and Front Right speakers and Subwoofer are activated.

#### D. **DOLBY PRO LOGIC II**

Pro Logic II uses a directional emphasis circuit to decode five output channels (Front Left & Front Right, Centre and Surround) from a stereo audio channel.

#### E. **DTS/DOLBY DIGITAL**

When playing 5.1CH source, and while you are enjoying Stereo, press this button to playback source in DTS/DOLBY DIGITAL.

#### F. **PHONES JACK**

For private listening, insert your headphones (1/4 -inch plug) into the PHONES jack. The centre and surround speakers will be cut automatically.

**Note:** When using headphone, the audio output will automatically down mix to STEREO.



## BASIC OPERATION

### PLAYING VIDEO SOURCES

1. Select DVD, VIDEO1, VIDEO 2 by pressing the corresponding button.
2. Play the sound source corresponding to the source selected (for example, if you have selected DVD, press PLAY on your DVD player).
3. The picture from the video source will be transmitted to the TV and the sound from the video source will be heard from the speakers.

### THE RADIO OPERATIONS

#### Automatic Tuning

1. Press the **POWER** button, then press the **TUNER** button to turn ON this unit.
2. Select TUNER mode by pressing the **TUNER** button.
3. Select the appropriate frequency band (FM or MW) by pressing the **TUNER** button again.
3. Press the **AUTO/MANUAL** button on the remote to activate automatic selection. (**Note:** default mode is Manual selection) "Auto" now appears on the display.
4. Press the **TUNING +/-** on the remote to select the station you want to listen to. When a station is tuned in, the tuning process will stop automatically. (Automatic station selection)
5. Press **TUNING +/-** on the remote again to select another channel.

#### MANUAL TUNING

Use this function for selecting stations which cannot be tuned automatically due to a weak signal

To tune a channel manually:

Skip step 4 in the above procedures. Each time the **TUNING +/-** button is pressed momentarily (0.5 second or less), the frequency changes by a fixed increment (FM: 50 kHz increments, MW: 9 kHz increments).

#### FM Modes Available:

Press the **STEREO** button to alternate between Stereo mode and Mono mode.

**Stereo:** FM stereo broadcasts are received in stereo and the "∞" indicator lights on the display.

**Mono:** Use to compensate for weak FM stereo reception. Reception will now be forced to monaural, reducing unwanted noise.

#### PRESET TUNING

This facility is used to store FM and MW stations from channels 1 to 15 respectively.

##### Automatic Memory Presetting:

1. Select TUNER mode by pressing the **TUNER** button.
2. Select MW or FM by pressing the **TUNER** button again.
3. Press the **APS** button.  
The 15 best-reception stations in your area will be automatically stored.

##### Manual Memory Presetting

1. Select TUNER mode by pressing the **TUNER** button.
2. Select MW or FM by pressing the **TUNER** button again.
3. Press the **TUNING +/-** button on the remote to select a station you want to preset.
4. Press the **MEMORY** on the remote button briefly.
5. While the "MEM" indicator is lit, press **TUNING +/-** button to select a preset station. The station number will be displayed on the screen.
6. Press the **MEMORY** button again.

To store more stations, repeat steps 3 to 6.

#### How to select preset stations

Ensure you are in TUNER mode and press the **STATION** button to select a preset radio station.

## BASIC OPERATION

### RADIO DATA SYSTEM (RDS)

RDS is a method for the transmission of additional information from local radio stations (the system only operates for radio stations broadcasting in FM). Using RDS data you can see the name of the radio station, the name of the program and/or the type of program, all shown on the multi-function display (**Note:** RDS only functions when the local radio station includes the RDS transmission within its signal and when the signal is strong enough).

By pressing the “**DISPLAY**” button on the Remote Control, you can select the following RDS functions: PS, PTY, CT and RT.

#### a) PS (Program Service Name)

Press “**DISPLAY**” on the remote until “**PS**” appears. The current station name will be shown (**Note:** “**NO PS**” will be shown if the signal from local radio station is not strong enough or if the local station is not transmitting RDS data).

#### b) PTY (Program Type)

Press “**DISPLAY**” on the remote until “**PTY**” appears. The current name type of the program will be shown (**Note:** “**NO PTY**” will be shown if the signal from local radio station is not strong enough or if the local station is not transmitting RDS data).

#### c) CT (Clock - Time)

Press “**DISPLAY**” on the remote until “**WAITING CT**” appears. After a short period the current time from radio station will be shown, e.g. 15:30 (**Note:** The **Clock - Time** will be only transmitted from local radio station once a minute, so you need to wait for less than 1 minute to show the result. (**Note:** “**NO CT**” will be shown if the signal from local radio station is not strong enough or if the local station is not transmitting RDS data).

#### d) RT (Radiotext)

Press “**DISPLAY**” on the remote until “**RT**” appears. Some radio stations broadcast simple text messages along with the RDS data which will be shown on the display. (**Note:** “**NO RT**” will be shown if the signal from local radio station is not strong enough or if the local station is not transmitting RDS data).

### 8. PTY SEARCH (Program Type Search)

1. Press “**PTY SEARCH**” on the remote control, “PTY SELECT” will flash on the display.
2. Press **TUNING +/-** to choose the program type, for example, NEWS, SPORT, etc.
3. Press “**PTY SEARCH**” again once you have chosen the program type.
4. When the type of program requested is found, the Tuner will stop searching. If no program is found, “NO FOUND” will appear on the display.

## SPEAKER CONFIGURATION, DELAY TIME & DYNAMIC RANGE CONTROL

### SPEAKER CONFIGURATION

It is important to configure your speakers correctly in order to get the most from your AV Receiver. This versatile AV Receiver provides the flexibility to experience multi-channel surround sound without a center speaker. However, for best results with Dolby Pro Logic II, DTS and Dolby Digital decoding, at least 5 speakers (Left, Center, Right, Left Rear and Right Rear) should be used. (**Note:** As with all surround sound configurations, we recommend the use of a Subwoofer speaker to fully experience the Low Frequency Effect encoded into most of today's DVD movies).

### BASS MODE

There are 2 preset speaker configurations based on the size of your speakers.  
Default is Mode 1.

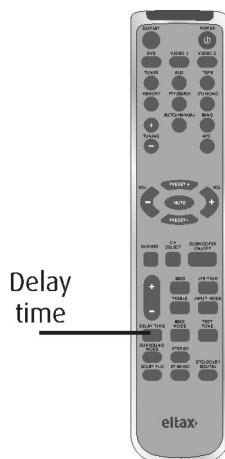
	Front L & R	Center	Rear L & R	Sub-Woofer
<b>Mode1</b>	Small	Small	Small	On
<b>Mode2</b>	Large	Small	Small	On

Press **BASS MODE** to select one of the 2 modes according to your speaker's size.

(**Note:** Large speakers can fully reproduce low frequencies of below 80Hz. Small speaker cannot reproduce low frequencies of below 80Hz with sufficient volume. Refer to your speaker specifications to select the correct size).

### DELAY TIME

The delay time can be individually set for the Dolby Digital/Dolby Pro Logic II modes using the **DELAY** (CENTER/REAR) buttons. When you adjust the delay time in the Dolby Digital mode, an additional 15 ms is automatically added to the surround channels in the Dolby Pro Logic mode. The current setting is shown on the display.



1. Press "**DELAY TIME**" on the remote control repeatedly, the corresponding speaker appears on the display: **S** → **C**
2. Press **+/-** button to set the time delay.

Delay Time Setting Adjustable Range

#### DOLBY DIGITAL MODES:

0-15 ms in 5 ms step (S-Delay)

0-5 ms in 1 ms step (C-Delay)

#### DOLBY PRO LOGIC II MODE:

10-25 ms in 5 ms step (S-Delay)

In the surround modes, the sound from the speakers should be delayed slightly, relative to that from the front speakers.

The optimum delay time will depend on acoustic properties, whether the walls and furnishings reflect or absorb sound, etc.

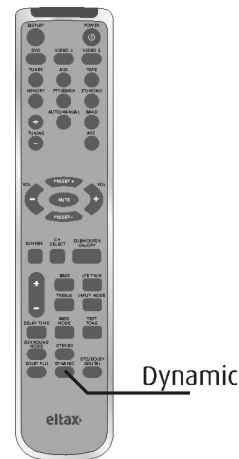
It is recommended that you try different delay times to obtain the best effect. The delay is digitally synthesized.

For the highest sound quality with minimum noise and distortion, the delay time can be set independently for each surround mode using the **DELAY TIME** buttons, with the current setting shown in the display.

### DYNAMIC RANGE CONTROL

This button controls the compression range of sound track. If the compression is large (DRC = 4/4), the sound effect is retarded to a certain range. As a result, sound effect is not as excited as normal range DRC = 0/4). It is useful when you want to movies at the late night.

- Press **DYNAMIC** on remote control repeatedly until the desired compression range reached.



**DRC=0/4**

**No Compression**

**DRC=1/4**

**DRC=2/4**

**DRC=3/4**

**DRC=4/4**

**Greatest Compression**

#### Note:

1. The Dynamic Range Control state will resume to normal if you do not press it after 5 seconds.
2. Dynamic Range Compression is not possible with DTS sources.

## TEST TONE, LFE TRIMMER & CHANNEL SELECT

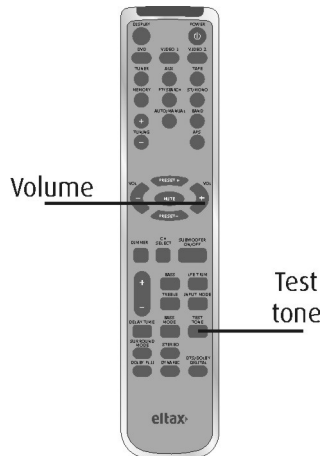
### TEST TONE

#### Speaker Level balance Adjustment

The test tone function is useful to adjust the relative volume between speakers in DOLBY DIGITAL or DOLBY PRO LOGIC II mode. Once the balance is set, you don't have to change the balance as long as the speakers aren't moved.

1. Adjust the **MASTER VOLUME** to the normal listening level. (Half of max. Volume is recommended)
2. Press the **TEST TONE** button (on the remote control) in DTS, Dolby Digital or Dolby PRO LOGIC II mode.

The test tone is emitted from each speaker each time you press "TEST TONE".



↑ →L(FRONTLEFT)→R(FRONTRIGHT)→LS (SUR. LEFT)  
 ← SUB ← C (CENTER) ← RS (SUR. RIGHT) ↓

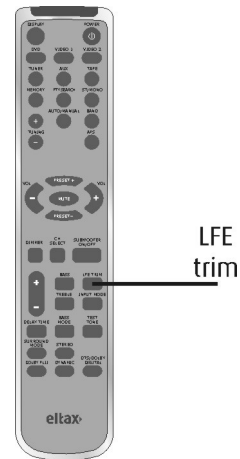
3. Select a speaker by pressing the "TEST TONE" button and adjust the level by pressing the **MASTER VOLUME** button. The level of each speaker can be adjusted in 1 dB step from -10 dB to +10 dB.
4. When the setting is finished, press the TEST TONE button to stop the test tone. (**Note:** You must keep press TEST TONE until one complete cycle is finished.)

### LOW FREQUENCY EFFECT

#### LFE (LOW FREQUENCY EFFECT) MIX LEVEL (LFE MIX)

initial setting: 0 dB

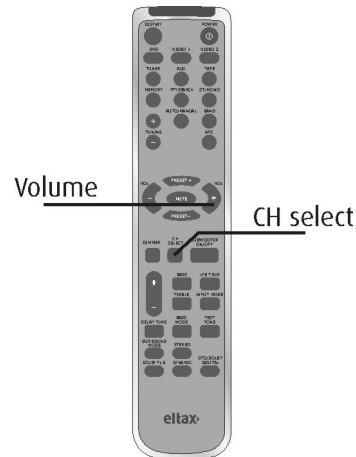
Under COAX./OPT mode, when playing a Dolby Digital or DTS 5.1CH signal, LFE will appear on the display. Press the **LFE** key on the remote and press the **VOL +/-** button to adjust the level between 0dB to -10dB. (**Note:** The **LFE** adjustment function will resume to normal, if the **VOL +/-** button is not pressed within 5 seconds.)



### CHANNEL SELECT

Balancing volume between speakers in 5.1 channel mode when using the 5.1 analogue inputs.

As the Dolby Digital signal is decoded in the external source, sometimes, you may have to balance volume between speakers due to the location of speakers. In this case:



1. Press "CH SELECT" on the remote, the following loop will appear on the display:

→ L(FRONT LEFT)→R (FRONT RIGHT)→LS (SUR. LEFT)  
 ↑← SUB ← C (CENTER) ← RS (SUR. RIGHT) ← ↓

2. Adjust the **Master Volume** to balance all speakers. The level of each speaker can be adjusted in 1 dB steps from -10 dB to +10 dB. (**Note:** If the **Master Volume** is not adjusted for 5 seconds in Channel Trimmer state, it returns to normal state.)

## AVAILABLE SURROUND MODE

### SURROUND MODE

The surround modes create a "live" atmosphere such as that experienced in movie theaters, discos, stadiums and concert halls. Select the appropriate surround mode according to the program source. (**Note:** Surround speakers are needed for DTS/DOLBY DIGITAL Dolby Pro Logic II surround modes to function).

It is recommended to use a Center speaker when operating this unit in DTS/DOLBY DIGITAL/Dolby Pro Logic II surround modes. The

DOLBY DIGITAL button can be pressed when you are using either an Optical or Coaxial cable as the input connection because these cables transmit the required encoded digital data.

**Manufactured under license from Dolby Laboratories. "Dolby", "Pro Logic" and the double-D symbol are trademarks of Dolby Laboratories**

The DOLBY PRO LOGIC and DTS buttons can be pressed when you are operating in **Analog Mode**.

When a Dolby Digital format signal is input, the surround mode automatically switches to the DOLBY DIGITAL mode.

### DTS DIGITAL SURROUND MODE



This unit is provided with the following Surround modes allowing you to enjoy 5.1 (or 6) discrete channels of high quality digital audio from DTS program sources bearing the **DTS** trademark such as discs, DVDs and compact discs, etc. DTS Digital Surround delivers up to 6 channels of transparent audio (which means identical to the original masters) and results in exceptional clarity within a genuine 360 degree sound field. The term DTS is a trademark of DTS Technology, LLC. Manufactured under license from DTS Technology, LLC. (**Note:** DTS program sources should be played back in DTS mode).

**"DTS", and "DTS Digital Surround" are trademarks of Digital Theater Systems, Inc.**

### DOLBY DIGITAL MODE



The Dolby Digital surround format lets you enjoy up to 5.1 channels of digital surround sound from a Dolby Digital program source. If you connect a DVD player or an LD player equipped with a DOLBY DIGITAL output to the DIGITAL (Dolby Digital)/DTS/PCM DIGITAL IN jack (Optical or Coaxial digital IN) on your AV Receiver and play DVD or laser discs with the Dolby Digital trademark, you will experience exceptional sound quality, great spatial accuracy, and improved dynamic range. This is because Dolby Digital delivers 5 totally discrete, full frequency audio channels (Front Left Right, Center, Surround Left and Right), plus a "0.1" channel called LFE (Low frequency-only effects channel).

Dolby Digital is a system developed by Dolby laboratories that transmits 5.1 digital signals, The surround system developed for movie theaters using this system is called "Dolby SR-D (Surround Digital)". Because each channel is completely independent, a realistic sound field with a "three-dimensions" feel is achieved which gives the sound a sense of distance, movement and relative position, creating a real and powerful sense of presence. Some Dolby Digital programs carry information that allow you to compress the dynamic range of sound track, without degrading the sound quality, for softer sound effects when watching movies late at night.

## TROUBLESHOOTING

To determine a problem with your AV Receiver, always check the most obvious possible causes first. If a problem still exists after having checked the possible causes below, consult your nearest dealer.

Problem	Probable Cause	Suggestion
<b>Amplifier</b>		
When listening to the music in stereo, Left/Right speakers are reversed.	Incorrect speaker connections.	Check and reconnect the speakers to the correct output on the AVR-320 rear panel.
Low hum or buzzing sound	The power cable of a fluorescent light is installed near this product or the speaker cables running over other power cables.	Place this product as far as possible from electric devices which emit electrical interference.
Sound is only heard from one channel	One of the input cables is disconnected or the BALANCE control is set incorrectly.	Connect the input cables securely And check the BALANCE control.
Sound cuts off when listening to the music or no sound even though power is ON.	Speaker impedance is less than prescribed for this unit.	After turning off the power and then turning it on again, reduce the volume or change to the correct 4 ohm speakers.
Low bass response.	Speaker polarity (+/-) is reversed.	Check all speakers for correct polarity.
<b>Tuner</b>		
A hissing noise is heard when listening to the broadcast in stereo, but not heard when listening in Mono.	White noise may be heard because the method used for modulation of FM stereo broadcasts which is different to that used for monaural broadcasts.	Try reducing the treble sound by adjusting the treble controls.
White noise is excessive in both stereo and monaural broadcasts.	Poor location and/or direction of the antenna or the transmitter station is too far away.	Set the <b>FM</b> mode to monaural by pressing the STEREO/MONO button. ( <b>Note:</b> that the broadcast will then be heard in Mono).
Sound is distorted and/or the volume level is low.	Broadcast signals are receiving interference.	If an indoor antenna is being used, change to an outdoor antenna
Excessive distortion in Stereo mode.	Weak signal.	Try using an antenna with more elements.
<b>Surround Effects</b>		
<b>(Important) The Centre and Rear speakers only operate when the unit is set to a Surround Sound mode and the source material being played is recorded or broadcast in Dolby Digital, DTS or Dolby Pro Logic surround sound. Stereo broadcasts or recordings will produce some rear channel effects when played in a surround mode. However, mono sources will not produce sound from the rear speakers.</b>		
No sound from the rear speakers	SURROUND ON/OFF button is set to OFF. Source being played is not recorded or broadcast in surround sound or stereo. One or more of the rear speakers is not connected properly.	Set SURROUND ON/OFF to the desired surround sound mode. Use a surround or stereo source. Check all rear speaker cables for good connections.
No sound from the Centre speaker	SURROUND mode is not set to DOLBY DIGITAL, DTS or DOLBY PRO LOGIC.	Set the SURROUND mode to DOLBY DIGITAL, DTS or DOLBY PRO LOGIC.
<b>Remote Control Unit</b>		
Remote control not working	The batteries are exhausted. The remote control unit is too far from this unit or out of the effective range	Replace with new batteries. Operate the Remote Control unit within the effective range

## SPECIFICATIONS

### AUDIO SECTION

Rated Power Output	FRONT CENTER REAR	50W + 50W 50W 50W + 50W
Output Terminals	FRONT CENTER REAR	4 - 8 ohms 4 - 8 ohms 4 - 8 ohms
Total Harmonic Distortion Less than 0.05% at 1/2 rated power output		

### LINE INPUT

Input Sensitivity/Impedance	150mV/47k $\Omega$
Frequency Response	20Hz~20KHz +0.5/-1dB
Tone Control Range	$\pm$ 6dB BASS and TREBLE
Signal-Noise Ratio	75dB

### WOOFER OUTPUT

Rated Output/Impedance	150mV/10/k $\Omega$
Frequency Response	10Hz~300Hz $\pm$ 3dB

### FM TUNER SECTION

Frequency Range	87.5~108MHz
Sensitivity	14dB (5uV)
Antenna Terminal	75 ohm (unbalanced)

### MW TUNER SECTION

Frequency Range	522~1629KHz (Europe) 9KHz step 530~1710KHz (US) 10KHz step
Sensitivity	68dB/M
Signal-to-Noise Range	30dB
Antenna	Loop Antenna

### VIDEO SECTION

Standard Video Jacks Input and Output Level/Impedance	1 Vpp/75 $\Omega$
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### GENERAL

Power Supply	AC 220V-240V~50Hz
Power consumption	200Watts
Dimensions	430 (W) x 265 (D) x 136 (H) mm
Weight	7kg

\* Design and specifications are subject to change without notice.

For further information please visit our website:

[www.eltax.com](http://www.eltax.com)

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